AusNet Gas Services Pty Ltd

Gas Access Arrangement Review 2018–2022

Appendix 11D: Gas service incentives in Victoria and Albury

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Gas service incentives in Victoria and Albury

Report for AusNet Services and Australian Gas Networks

15 December 2016

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Executive summary

Australian Gas Networks (AGN) and AusNet Services (ANS) have engaged Farrier Swier Consulting (FSC) to design incentive scheme options that could counterbalance the possible service performance incentive implications of applying a capital expenditure efficiency sharing scheme (CESS) to their gas networks.

Background

Building on the outcomes of their customer engagement about incentive objectives and design options, AGN and ANS are each now proposing to introduce a CESS in the next access arrangement (AA) period.

They have published an issues paper and conducted stakeholder engagement on gas incentive design, the outcomes of which are captured in the FSC report *Victorian Gas Distribution Businesses' consultation on Incentive Mechanisms* dated 23 September 2016 (the Findings Report).

The Australian Energy Regulator (AER) published its Statement of Intent 2016-17 which set out its intention to introduce a CESS for gas distribution businesses. During the incentives consultation process the AER expressed concerns about the possible service performance incentive impacts of introducing a CESS. The Findings Report observed:

> *the AER considered that if a CESS was introduced then at a minimum this needed to be accompanied by a sufficient customer service incentive to counter-balance incentives for inefficient cost reduction. It appeared there was general agreement from stakeholders with this view.*

AGN and ANS have considered two possible options for addressing the AER's service performance counter-balance concerns:

1. *Gas Service Target Performance Incentive Scheme (STPIS)* – which we referred to as a customer service incentive scheme in the consultation and Findings Report – Developing a gas STPIS based on that which the AER applies to electricity networks
2. *Contingent Payment Approach* - Developing a counterbalancing incentive that is self-contained within the CESS design. This option would make earning incentive rewards through the CESS contingent on the network meeting asset condition targets for those measures that the businesses use to monitor service integrity.

Our task

We have been asked to:

1. Describe the incentive considerations relevant to introducing a CESS and designing balancing service incentives
2. Design a gas STPIS that seeks to address the requirements of the National Gas Rules (NGR) rule 98
3. Design a contingent payment approach that seeks to address the requirements of the NGR rule 98
4. Having regard to item 1 and engagement outcomes in the Findings Report, recommend which service counterbalance option is preferable for addressing the AER's service performance concerns for a CESS applying in the next AA period, and
5. Where relevant, note any recommendations for future refinement of service counterbalance incentives.

We have not been asked to assess whether an incentive scheme is needed or whether there are alternative ways beyond the two cited above to balance any service incentive implications associated with having a CESS. Our recommended incentive design for each option reflects a pragmatic approach that seeks to improve the incentives for efficiency while avoiding service performance risk and which rely on the information available at this time.

We also note that the AER has recently released an information paper on the CESS for gas distribution networks.[1] Due to the timing of this report, we have not had regard to the AER's information paper (dated 13 December 2016) in preparing our report.

Our approach

Farrier Swier Consulting has followed a four-part approach:

1. review the current incentive framework, NGR requirements, customer preferences and practical considerations to develop a set of service incentive design criteria (section 1)
2. develop a STPIS design and specification (section 2), including that we:
    a) consider options for the key design elements of the STPIS, drawing from alternative schemes and stakeholder feedback where appropriate, before developing specific designs and testing these against the design criteria (Appendix A, sections A.1 and A.2)
    b) determine the indicative targets and incentive rates for each performance metric that underpins the STPIS design using available data and recognising the infancy of such a scheme (Appendix A, section A.3)

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[1] AER, *Capital expenditure sharing scheme for gas distribution network service providers: Information paper*, 13 December 2016.

3. develop a contingent payment design (section 3), including that we:
    a) design a mechanism and test it against the design criteria (Appendix B, section B.1)
    b) determine the indicative targets for each asset performance measure and the performance thresholds (explained below) that underpins the contingent payments scheme using available data (section B.2)
4. examine which design is preferable to apply in the next AA period, including which is more capable of meeting the rule requirements, and what future refinements might be considered (section 4).

This approach ensures that our recommended design (in section 4) links directly to both current knowledge of customer preferences and incentive framework requirements.

Recommendation

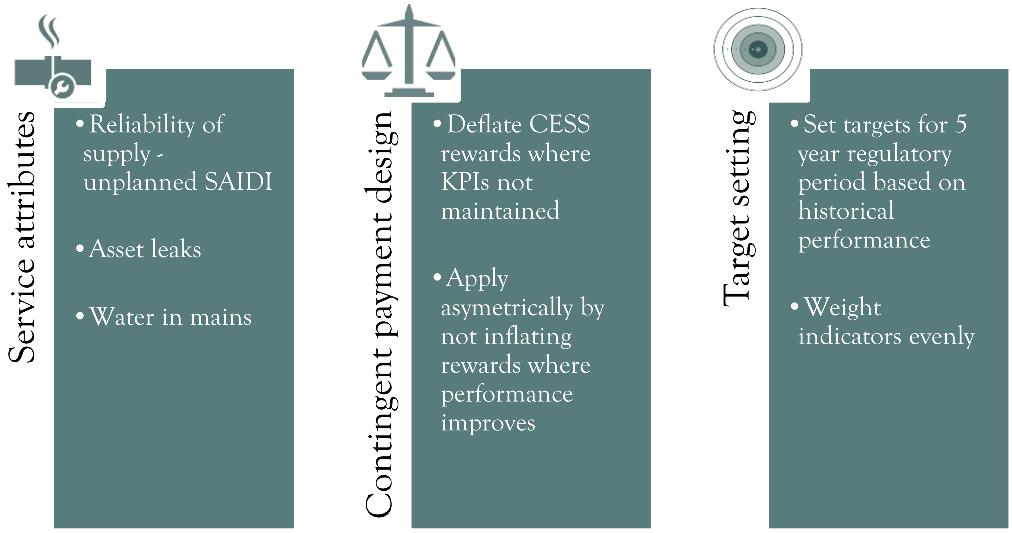
For the purposes of the next AA period, this report recommends adopting the **contingent payments approach** as the better option – of the two considered – for counterbalancing the service performance incentive implications from applying a CESS to gas networks.

Overall this approach is preferred because it is more proportionate to the incentive issues it seeks to address, particularly having regard to currently stated customer preferences for maintaining rather than improving service performance. It also recognises that customer preference is vital for designing a counterbalance to the CESS that is fit for purpose.

This report recommends adopting a contingent payment design that modifies the CESS as summarised in Figure 1 such that:

1. CESS penalties remain unaffected by asset performance outcomes
2. full CESS rewards are only payable where asset performance outcomes do not drop below historical levels, and
3. to the extent CESS rewards are being earned at the expense of asset performance outcomes, they are discounted accordingly – with no rewards payable if outcomes drop below threshold levels set based on variance in historical performance.

Figure 1 – Summary of recommended contingent payments design



The recommended asset performance indicators to apply over the 2018–22 regulatory period are:

1. Reliability of supply – unplanned SAIDI per customer per year – which measures the average duration (in minutes) of unplanned service disruptions on average across all customers
2. Gas leaks – which measures the number of publicly reported gas leaks in mains, services or meters that require corrective works per year
3. Water in mains – which measures the number of instances of water seeping into the network through degraded pipe assets per kilometre of network per year.

We recommend a design where:

- the scheme is applied once every five years as part of applying the CESS
- targets for each of the measures is set using the longest period of historical data available, up to and including the five most recent years.

We have calculated indicative targets for the next AA period in Table 1. For the purposes of measuring performance, we consider it reasonable that the three measures are aggregated into an index (with base 100) with 1/3 weight applied to each.[2] Any CESS reward would then start reducing if actual performance – in terms of an index –

[2] We recommend that the index for each measure is calculated as: 200 – [*Actual performance*] / [*Target performance*] x 100, where *actual performance* is measured as the simple average of actual performance over the 2018-21 July to June financial years. The 2022 financial year is not included because data may not be available in time for next AA final determination. July to June financial years are used because most of the data needed for the three measures is reported in those years rather than in calendar years.

falls below a minimum threshold and falls to zero if performance falls to a maximum threshold.

This ‘sliding scale’ between these thresholds implicitly assumes that customers are willing to fund some CESS rewards even if asset performance falls below current levels, up until it hits that maximum threshold. Customers have noted that they are comfortable with current levels of service, including with reliability of supply. This provides some support for setting thresholds based on the levels and volatility of performance over recent years to determine what service levels might be acceptable to customers in the future.

With this observation in mind, we do not recommend specific thresholds for AGN and ANS at this stage, although an approach that relies on probability theory could be used to turn this past performance volatility into the thresholds for the sliding scale. Indicative thresholds for the next AA period are explained in Appendix B. Section B.3 shows how the contingent payments approach would apply at the subsequent AA revision review.

Table 1 – Asset performance indicator targets for the 2018–22 regulatory period[3]

Measure	AGN	ANS
Unplanned SAIDI[4]	3.694 mins	0.914 mins
Leaks	13,854	12,341
Water in mains	0.073 per kilometre of main	0.071 per kilometre of main

Finally, we note that – if adopted – the contingent payment approach could be refined over time to incorporate customer and other stakeholder feedback, including in relation to the thresholds and asset performance indicators to ensure they remain relevant to the forecast capital expenditure being considered.

[3] It is important to note that the basis for reporting some data, such as unplanned SAIDI, varies between AGN and ANS and that this explains at least some of the variation between the targets.

[4] The unplanned SAIDI targets identified here for the contingent payments approach differ from those determined for the gas STPIS approach. This is because the data used was reported for each was reported in different years: the former in calendar years and the latter in Australian (July to June) financial years.

1. Incentive framework

The overarching objective of economic regulation of gas distribution businesses in simple terms is to promote economic efficiency for the long-term interest of consumers – which forms an important starting point when designing a counterbalance to the CESS.

This objective is given effect by the AER subjecting those businesses to an *ex ante* five year determination of prices (or revenues) and other regulatory arrangements[5] – where prices are set in advance and the businesses have an opportunity to benefit by working to reduce their costs below those assumed in setting prices. These arrangements provide incentives for businesses to seek out efficiencies, and also to generate information which enables the AER to share efficiencies with customers. Incentive regulation is also designed to leave day-to-day decision-making to the network business.[6]

However, this simple incentive design may create other – perhaps adverse – incentives for businesses to behave in ways that overall do not promote economic efficiency. For example, unless it is carefully designed an incentive mechanism may provide uneven incentives for businesses to seek efficiencies over a regulatory period. Strong incentives to cut costs may also lead to undesirable reductions in service quality.

Over time, therefore, incentive regulation in Australia and in other jurisdictions has evolved to introduce a range of more sophisticated incentive arrangements that are designed to address such problems. They aim to provide a holistic package of incentives that work together to better promote efficiency for the long-term interest of consumers – and this is where we must start.

This section, therefore, sets out:

1. current regulatory requirements (section 1.1)
2. customer requirements and feedback (section 1.2)
3. practical considerations, particularly data availability (section 1.3)

before adopting:

4. a set of design criteria for assessing potential STPIS and contingent payment design elements and specifications (section 1.4).

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[5] For example, choices about the reference tariff variation mechanism (e.g. weighted average price cap, revenue cap) will create differing incentives for a regulated business.

[6] See Chapter 5, *Electricity Network Regulatory Frameworks Pro*ductivity Commission Inquiry Report, Volume 1 April 2013

1.1 Regulatory requirements

While the National Gas Rules (NGR) and National Gas Law (NGL) provide limited guidance on the design of a contingent payments approach or STPIS that satisfies the National Gas Objective (NGO), they do provide a useful starting point.

NGR rule 98 governs the design of incentive mechanisms included in an AA:

> 98 ***Incentive mechanism***
>
> *(1) A full access arrangement may include (and the AER may require it to include) one or more incentive mechanisms to encourage efficiency in the provision of services by the service provider.*
>
> *(2) An incentive mechanism may provide for carrying over increments for efficiency gains and decrements for losses of efficiency from one access arrangement period to the next.*
>
> *(3) An incentive mechanism must be consistent with the revenue and pricing principles.*

Apart from allowing the carryover of rewards and penalties between periods and referring to the revenue and pricing principles, rule 98 does not limit the scope of what a STPIS or contingent payment might look like. The principles referred to in the rule are set out in section 24 of the National Gas Law (NGL):[7]

> 24 ***Revenue and pricing principles***
>
> *(1) The revenue and pricing principles are the principles set out in subsections (2) to (7).*
>
> *(2) A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in–*
>
> *(a) providing reference services; and*
>
> *(b) complying with a regulatory obligation or requirement or making a regulatory payment.*
>
> *(3) A service provider should be provided with effective incentives in order to promote economic efficiency with respect to reference services the service provider provides. The economic efficiency that should be promoted includes–*
>
> *(a) efficient investment in, or in connection with, a pipeline with which the service provider provides reference services; and*
>
> *(b) the efficient provision of pipeline services; and*
>
> *(c) the efficient use of the pipeline.*

[7] National Gas (South Australia) Act 2008, Schedule 1, Section 24.

> (4) *Regard should be had to the capital base with respect to a pipeline adopted–*
>
> (a) *in any previous–*
>
> (i) *full access arrangement decision; or*
>
> (ii) *decision of a relevant Regulator under section 2 of the Gas Code;*
>
> (b) *in the Rules.*
>
> (5) *A reference tariff should allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service to which that tariff relates.*
>
> (6) *Regard should be had to the economic costs and risks of the potential for under and over investment by a service provider in a pipeline with which the service provider provides pipeline services.*
>
> (7) *Regard should be had to the economic costs and risks of the potential for under and over utilisation of a pipeline with which a service provider provides pipeline services.*

Section 24(3), as highlighted in the quote above, is arguably most relevant and emphasises that a service provider should be encouraged to promote efficiency, including when providing pipeline services to consumers. This aligns with the NGO (section 23 of the NGL) being to:

> *promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.*

Yet, neither the NGO, nor the NGL more broadly, limit the scope of an incentive mechanism, provided its design seeks to promote economic efficiency and long-term customer interests and do not undermine the other revenue and pricing principles. We are not aware of any other NGR or NGL requirements that are directly relevant to the design of the STPIS or contingent payment.

1.2 Customer requirements

At its core, an incentive mechanism should be aligned to customer requirements, including by promoting service outcomes that are important to them. It is therefore essential when designing a STPIS or contingent payment that these outcomes are factored in.

Both AGN and ANS engage with their customers about the services that they provide, including through regular and ongoing customer and stakeholder forums as well as targeted consultations, such as on incentive mechanisms. From this engagement, the networks advised us that their customers:

> - *view gas as a reliable source of energy and value the current standard of reliability – they support initiatives to maintain that reliability and improve network safety and reduce leaks, although it is not clear that they value improving reliability*
> - *complain when connection times are slow or the process is confusing or complicated*
> - *value networks responding quickly to unplanned outages and providing timely communication about them*
> - *value public amenity, including by ensuring that restorations are complete and do not damage property and by avoiding exposure to adverse gas smells*
> - *would like to access more information from networks, such as about planned supply outages, and favour digital channels for doing so.*

Together, this feedback suggests that customers value services that are reliable, timely and responsive, and avoid unnecessary risks (such as public and employee safety) and cost. We use this to inform our analysis that follows, including the design criteria.

1.2.1 Stakeholder feedback

Our Feedback Report also outlined stakeholder views on the need or otherwise to counterbalance CESS cost efficiency incentives, and on a potential customer service incentive scheme for the Victorian gas distribution businesses.

We observed differing views on objectives:

1. At a minimum, a scheme should provide a counter-balance to incentives for inefficient cost reduction – this was supported by CUAC, who emphasised that there should be a greater focus on attributes (and measures) that dis-incentivise inefficient capital expenditure reductions
2. However, a scheme may go further by promoting improved service outcomes for customers by better aligning the incentives for a business with the outcomes desired by customers, such as those relating to customer connections or service – this objective was supported by the Energy Networks Association (ENA).

Specifically, the ENA noted that it:

> *…considers that the CSIS [a gas STPIS] can provide benefits to consumers by encouraging a strong focus on improving performance and better aligning the incentives for the business with outcomes that are desirable for customers.*[8]

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[8] Farrier Swier Consulting, *Findings Report | Victorian Gas Distribution Businesses' consultation on Incentive Mechanisms, 2018 to 2022 Gas Access Arrangement Review* (Incentives findings paper), September 2016, p.16.

The ENA's view also supported discussion that assumed that any service incentive scheme would draw on some of the features of the current electricity distribution STPIS.

CUAC however emphasised that the role of a service incentive, in their view, was to "ensure a capex underspend does not result in compromised service standards". CUAC considered that service incentives should be closely linked to capex:

> *The metrics proposed in the incentive mechanism position paper may not be the most appropriate metrics to address compromised reliability, safety and quality of supply standards resulting from capex underspend.*
>
> *The proposed metrics consider customer service outcomes which appear more closely linked to opex than capex. The distributors should reconsider revising the incentive metrics as part of this proposed mechanism so that they are more closely linked to capex.*[9]

CUAC also considered that it may be the case that a revised and strengthened GSL scheme could provide a more appropriate check on capex underspend than a customer service incentive. The challenge, of course, with such a scheme is that it only serves to penalise businesses if outcomes do not meet some minimum standard, ignoring improvements to service attributes that customers may want.[10] In any event, this report does not consider whether alternatives to a STPIS or contingent payment – such as a strengthened GSL scheme – would provide a better counter-balance to a CESS.

1.3 Practical considerations

A key input to either option is data – which is used to both measure performance and set targets, as well as to determine appropriate incentive rates that are used to map performance into financial rewards and penalties in the case of the STPIS. Therefore, as a practical consideration, it is important when designing the options to understand what data is available now and what might be (or should be) available in the future.

AGN and ANS currently report service performance, asset performance and other data to the Energy Safe Victoria (ESV) on a quarterly and annual basis. Both networks also provide data to the AER annually in response to gas distribution regulatory information notices (RINs). And finally, both networks also report annually to the Energy Council of Australia as part of its *Natural Gas Distribution Benchmarking report* (specific to each network).

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[9] Incentives findings paper, p.17.

[10] A GSL also only focuses on the worst served customers rather than the average customer, which is the focus of the expenditure incentive mechanisms (i.e. the CESS and EBSS).

Relevant service data reported to the ESV and the AER, or collected in the benchmarking report include:

1. reliability – including planned and unplanned outages, duration, customers affected by type and number
2. service quality – measured by line pressure
3. responsiveness to gas supply incidents
4. unaccounted for gas and reported leaks
5. instances of water in mains
6. customer complaints by type
7. connection timeliness – measured relative to agreed time, not total time from request
8. GSL payments – including those made for frequent or lengthy interruptions, for missed appointments, and for late connections relative to an agreed date.

AGN voluntarily publishes its customer satisfaction indicator – and has done so for the last 12 months – while ANS tracks a customer effort score internally. ANS also tracks its call centre responsiveness for its gas network specifically, while AGN tracks this at a national level across its various gas networks. Both networks also have data measuring the duration of leaks, although some adjustment is needed to ensure this is meaningful.

Neither network has this data audited at present, although it could be audited in the future.

1.4 Design criteria

When designing incentive options it is important that any design satisfies the principles of best practice regulation; namely, *proportionality, targeted, consistent, efficient and manageable allocation of risk.* These ensure that the resulting regulated scheme is fit for purpose.

It is also important to recognise that an incentive scheme is typically – but not necessarily always – seeking to financially motivate a desired behaviour *in excess* of the minimum behaviours and resulting service or efficiency outcomes mandated upon service providers (e.g. licence and gas distribution system code obligations). This, therefore, supports incentive schemes that allow networks to balance outcomes (e.g. price and service) in an efficient way, aligned to customer interests.

For this report – and in part drawing from the discussion above – we adopt the following five criteria:

1. *Proportionate* – Do customer benefits and harms warrant the rewards and penalties, and are customers willing to pay for improvements? *and/or* Is the additional regulatory burden warranted for the additional incentive improvement?
2. *Targeted* – How have the networks previously performed on these attributes relative to customer expectations? *and* To what extent do other obligations and incentives

on the networks affect these service attributes (including cost efficiency incentives and minimum obligations)? *and* Is there quality data available to accurately measure that performance?

3. *Consistency* – Should a design feature align with electricity approaches where practical?
4. *Efficient* – Does a design feature incentivise behaviour that supports the efficiency objective that underpins the NGO and the revenue and pricing principles?
5. *Manageable allocation of risk* – Does the mechanism provide manageable opportunity for the network to achieve reward and avoid penalty, and therefore incentivise efficient behaviour to manage risk?

These design criteria are used in the balance of this report to come up with a possible STPIS design, and a possible contingent payment design, and to then identify which of these is preferable for the next AA period.

An important implication of this holistic set of design criteria is that the choice of service attributes may be broader than those that just relate to capital expenditure, and could include those that relate to activities affected by operating expenditure decisions.

2. STPIS scheme design

A service incentive scheme creates financial rewards and penalties linked to service outcomes, and should be designed to offset incentives to reduce costs in a way that undermines those outcomes. Ultimately, a business subject to such a scheme should be encouraged to find the optimal balance between the service outcomes and cost (or price) that customers want.

At its core, then, a service incentive scheme is based on meaningful and customer-valued service attributes. Performance against these attributes – or the measures used to assess them – is then mapped into financial outcomes using a pre-determined approach, ensuring that the incentives facing networks are clear at the outset (i.e. before operating and capital decisions are made).

This section gives an overview of our design and specification for testing a gas STPIS. Appendix A provides our detailed assessment of STPIS design and specification, including by:

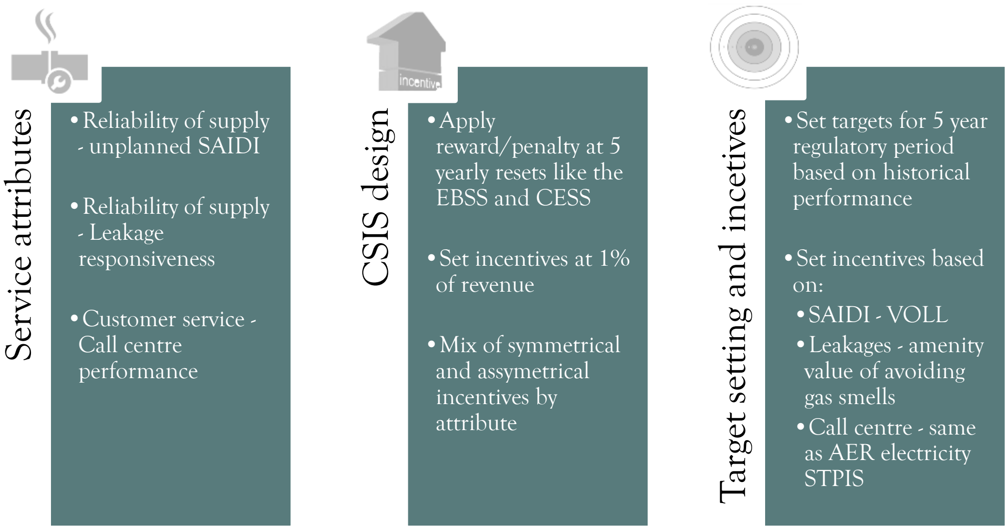
- reviewing alternative service incentive schemes in section A.1
- assessing design elements and then identifying our preferred STPIS design – if one were adopted – in section A.2, then
- seeking to implement this design for AGN and ANS by determining the indicative targets and incentive rates that would apply over the 2018–22 regulatory period – in section A.3.

2.1 Overview of our design and specification

This sub-section considers a STPIS design similar to the existing electricity STIPS, adjusted to reflect Victorian and Albury gas customer preferences, the data available to AGN and ANS, and a level of regulatory complexity that is more fit-for-purpose for gas incentives.

This STPIS would operate to reward or penalise gas businesses for performing better or worse than service performance targets set prior to the start of a regulatory period, and is summarised in Figure 2.

Figure 2 – Summary of gas STPIS design



Given the data limitations at present, if this option were adopted, we would suggest implementing the STPIS over two stages to manage data availability and to allow the networks to test their customers' preferences over time:

1. An initial version of the gas STPIS would apply over the 2018–22 regulatory period, focusing on three service performance measures:
   a) Unplanned SAIDI per customer – which measures the average duration (in minutes) of unplanned service disruptions across all customers
   b) Gas leakage responsiveness – which measures the duration (in minutes) between when a gas leak is first identified by or to the network, through to when the site (or source of the leak) is made safe[11]
   c) Call centre responsiveness – which measures the share of calls to the emergency and fault line that are answered within 30 seconds.
2. The STPIS could then potentially be expanded at the next AA revisions review – to apply to the 2023–27 regulatory period – to also cover up to two further service performance measures, once the data becomes sufficiently reliable and customer preference is confirmed:
   a) Customer connection times – which measures the time that it takes from the time a connection request is made by a customer to when that connection is made

[11] The difference in end-point between AGN and ANS is due to availability of data. Ideally, the duration would be measured up to when a site is made safe as this more closely corresponds to when a leak stops. However, where this duration is not available – as is the case for AGN – it is reasonable to use the time when a site is complete (i.e. after which no more work is performed at the site). This is further discussed in Appendix B.

b) Customer satisfaction – which is an aggregate measure of customer satisfaction among a representative sample or subset of customers, such as net promoter score, customer effort scope, or customer satisfaction index.

Under this option, we also consider that initially:

1. the scheme should be applied once every five years using a carryover mechanism like that applying to the CESS and the efficiency benefit sharing scheme (EBSS)
2. penalties or rewards from the scheme be capped to 1% of annual revenue, with penalties or rewards from the call centre responsiveness measure capped at 0.5% of annual revenue
3. targets for each of the measures be set using the longest period of historical data available, up to and including the five most recent years.

For the initial version of the gas STPIS, we have calculated the following indicative STPIS targets and incentive rates for the three measures.

Table 2 – Indicative STPIS targets and incentive rates for the 2018–22 regulatory period[12]

	AusNet Services		Australian Gas Networks	
Measure	Target	Incentive rate	Target	Incentive rate
Unplanned SAIDI[13]	0.871 mins	-6.156%	3.680 mins	-4.695%
Gas leakage responsiveness	106.558 mins	-0.102%	177.112 mins	-0.108%
Call centre responsiveness	82.945%	0.04%	77.448%	0.04%

Note: Rewards and penalties are calculated by multiplying the difference between actual and targeted performance by both the incentive rate and annual allowed revenue, subject to any caps or symmetry restrictions.

[12] It is important to note that the basis for reporting some data, such as unplanned SAIDI, varies between AGN and ANS and that this explains at least some of the variation between the targets.

[13] The unplanned SAIDI targets identified here for the gas STPIS differ from those determined for the contingent payments approach. This is because the data used was reported for each was reported in different years: the former in calendar years and the latter in (July to June) financial years.

3. Contingent payments scheme design

A potentially simpler alternative to introducing a STPIS is to modify the CESS itself to ensure that it creates financial rewards and penalties linked to desired service outcomes. While this alternative was not presented during stakeholder consultation, it responds to a number of the issues raised by stakeholders.

This section explains an approach that would make payment of CESS incentive reward amounts contingent on meeting specified key performance indicator (KPI) targets or other conditions. CESS penalties for overspending capex would remain unaffected.

This means that the CESS would be designed to offset incentives to reduce costs in a way that undermines service outcomes, and reflects gas customers' stated preference to maintain rather than improve reliability.

This section gives an overview of our preferred contingent payment approach design and specification. Appendix B provides our detailed assessment of the contingent payment approach design and specification, including by:

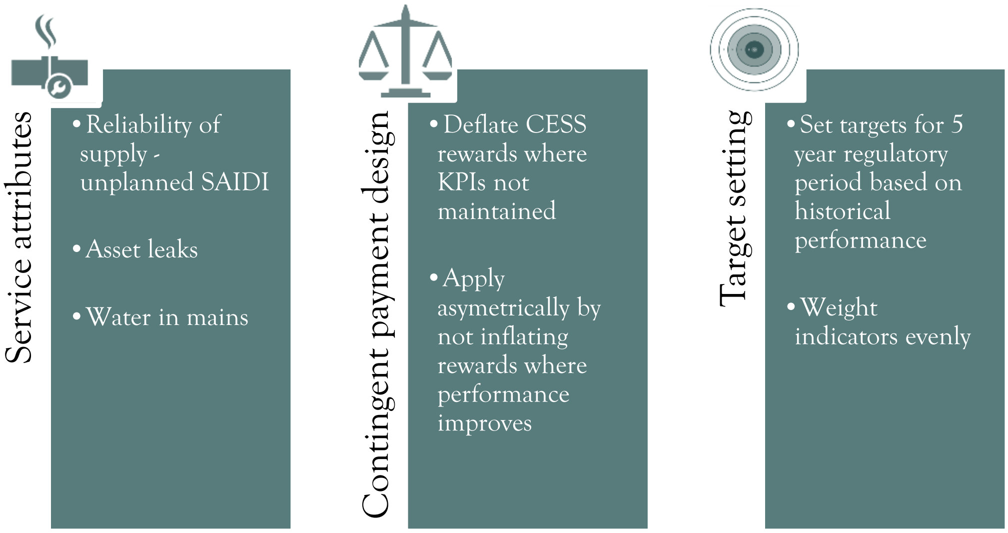
- examining what design elements must be considered and our preference for each (section B.1), then
- seeking to implement this design for AGN and ANS by determining the indicative targets and CESS reward scaling arrangement that would apply over the 2018–22 regulatory period (section B.2).

3.1 Overview of our design and specification

This sub-section considers a contingent payment design that modifies the CESS as summarised in Figure 3 such that:

1. CESS penalties remain unaffected by asset performance outcomes
2. full CESS rewards are only payable where asset performance outcomes do not drop below historical levels, and
3. to the extent CESS rewards are being earned at the expense of asset performance outcomes, they are discounted accordingly – with no rewards payable if outcomes drop below threshold levels.

Figure 3 – Summary of contingent payments design



The asset performance indicators to apply over the 2018–22 regulatory period are those which the networks use to monitor asset integrity and performance:

1. Unplanned SAIDI per customer – which measures the average duration (in minutes) of unplanned service disruptions
2. Gas leaks – which measures the number of reported gas leaks that require corrective works
3. Water in mains – which measures the number of instances of water seeping into the network through degraded pipe assets.

The contingent payment calculation would be performed at the subsequent AA review when determining the value of any CESS amounts payable to AGN and ANS. This calculation would rely on the targets in Table 3, using these to determine the extent to which performance across the three measures had improved above or dropped below those targets. This would involve:

- Converting actual performance to an index (with a base of 100) made up of an equal weighting of the three measures – with an index score below 100 indicating poorer asset condition than targeted[14]
- Setting a minimum threshold (in terms of an index score) for when a deteriorating asset condition starts reducing a CESS reward
- Setting a maximum threshold (again in terms of an index score) for when poor asset condition results in no CESS reward being allowed

[14] The mechanics of how this index is calculated is described in Appendix B.

- Making the CESS reward reduce linearly from 100% to 0% when asset condition falls from the minimum to maximum thresholds – in a form of 'sliding scale'.

This sliding scale between these thresholds implicitly assumes that customers are willing to fund some CESS rewards even if asset performance falls below current levels, up until it hits that maximum threshold. This reflects that customers have indicated that they are broadly comfortable with current levels of service, including with reliability of supply. This provides some support for setting thresholds based on the volatility of performance over recent years to determine what service levels might be acceptable to customers in the future.

With this observation in mind, we do not adopt specific thresholds for AGN and ANS as part of our design, although an approach that relies on probability theory could be used to turn this past performance and volatility into the thresholds for the sliding scale. We recognise, however, that expert asset management or engineering opinion would be needed to determine whether – and if so by how much – these thresholds would lead to reduced customer experience relative to history. We understand from AGN and ANS that the performance outcomes within the indicative thresholds set out in Appendix B would not create a perceptible performance change for customers.

Table 3 – Indicative asset performance indicator targets for the 2018–22 regulatory period[15]

Measure	AGN	ANS
Unplanned SAIDI[16]	3.694 mins	0.914 mins
Leaks	13,854	12,341
Water in mains	0.073 per kilometre of main	0.071 per kilometre of main

[15] It is important to note that the basis for reporting some data, such as unplanned SAIDI, varies between AGN and ANS and that this explains at least some of the variation between the targets.

[16] The unplanned SAIDI targets identified here for the contingent payments approach differ from those determined for the gas STPIS approach. This is because the data used was reported for each was reported in different years: the former in calendar years and the latter in Australian (July to June) financial years.

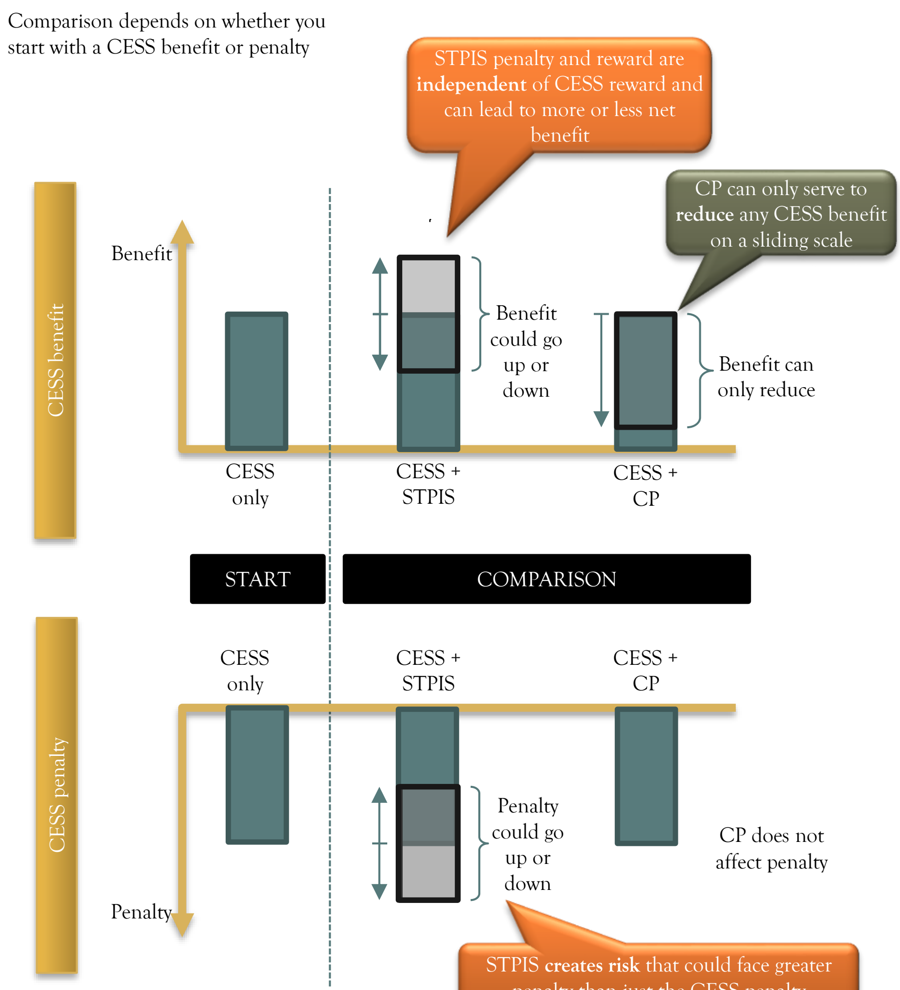
4. Assessment and recommendation

This section sets out our assessment of the two possible incentive scheme solutions using the design criteria discussed in section 1.4 and having regard to their relative ability to meet the rule requirements in the next AA period.

For the purposes of the next AA period, we recommend adopting the contingent payments approach as the better option for counterbalancing the service performance incentive implications from applying a CESS to the AGN and ANS Victorian and Albury gas networks.

Overall this approach is preferred because it better meets the ***proportionate*** design criterion. The contingent payments approach only scales efficiency rewards rather than creating additional service incentive payments. Figure 4 illustrates this point by comparing the extent of possible rewards and penalties under the two options.

Figure 4 – Comparison of proportionality and risks under the options



Note: figures not to scale.

It is currently not clear that customers are willing to pay for additional incentive payments that would encourage improved service performance. Therefore, the additional regulatory burden of adopting a STPIS scheme for the next AA period does not appear justified.[17] We note that this assessment is consistent with the feedback from stakeholders during consultation on incentive scheme where stakeholders – such as CUAC – wished that the gas businesses provide an appropriate empirical basis to support any proposal to introduce a STPIS.

We note that the contingent payments approach is a new approach which does not align with the electricity STIPS approach and arguably does not promote the ***consistency*** design criterion (i.e. consistency between gas and electricity network regulation). However, we consider that the context for gas distribution is sufficiently different from electricity that there is no significant benefit from a consistent approach, including because gas supply has high reliability levels relative to electricity supply. We also consider that the approach is sufficiently simple that the lack of consistency with electricity networks does not raise any concerns for understanding how the scheme operates.

The contingent payments approach promotes the ***efficient*** design criterion as it will penalise the business for reductions in expenditure that result in a decline in asset performance. The STPIS could potentially promote more efficient outcomes than the contingent payments approach, but there would need to be evidence of customer willingness to pay for improvements in outcomes, and as noted such evidence is not presently available. This is an area for potential improvement that could be investigated for the next AA period.

There is also an important difference between the two approaches from an NGL and NGR compliance perspective. Put simply, a STPIS requires evidence that there is a net better outcome for customers' long term interest from adding a STPIS and a CESS, whereas the contingent payment approach requires only that there is a net better outcome from adding the modified CESS.

This contrast is illustrated in Figure 4 above, which shows that any CESS benefits are at risk under the contingent payments approach and that there is no risk that networks will end up receiving more than the CESS benefits. This ability to satisfy rule 90 underpins our preference for the contingent payments approach because the data available today doesn't support a conclusion that customers are willing to fund an incentive scheme that motivates improvements in gas service reliability.

Finally, the contingent payments approach in principle can – using our preferred design – meet the ***targeted*** and ***manageable allocation of risk*** criteria:

[17] In terms of proportionate regulatory burden, a gas STPIS involves the burden of two new incentives schemes, whereas the CESS with contingent payment approach is only one.

- It has a clear link to attributes that are important to meeting customer expectations in terms of maintaining current network performance
- Data is available to accurately measure the asset performance indicators
- It provides a manageable opportunity for the network to avoid having CESS rewards eroded, and therefore incentivise efficient behaviour to manage risk.

Observing that the next AA period will be the first period in which a new form of CESS applies, it will be prudent to review the incentive effects and outcomes achieved under the scheme and corresponding service counterbalance. Concurrent with this, the networks can work to further assess their customers' service preferences and willingness to pay for these ahead of the subsequent AA review to ensure that the asset and service performance aspects of incentive design remain aligned to these.

Appendix A – STPIS scheme design

This appendix sets out our assessment of, and design for, a STPIS based on current information. Our design includes indicative scheme parameters to give effect to it that could be used if it were adopted – although we note that further work would be needed to validate the data and approaches used to determine these parameters.

A.1 Alternative schemes

Different jurisdictions have taken different approaches to incentivising efficient service outcomes, varying by both the breadth of service attributes covered and the strength of the incentives that apply.

At one end of the spectrum, the Office of Gas and Electricity Markets (Ofgem) in the UK sets a number of service quality outputs that distribution networks must target and provides explicit rewards and penalties for achieving these. At the other, the NZ Commerce Commission (NZCC) currently adopts a single minimum service quality standard – emergency response time – that gas distribution networks must achieve from a legal perspective. Somewhere in between is the AER's existing STPIS for electricity networks and the Victorian GSL scheme for gas networks.

Table 4 compares the features of these four schemes, while Table 5 compares the service attributes that they cover. This latter comparison informs our selection of service attributes in section A.2.1.

Table 4 – Comparison of alternative incentive schemes

Scheme	Description	Relevant features
AER electricity STPIS	In Victoria, the scheme is intended to balance incentives to reduce expenditure with the need to maintain or improve service quality, and does this by providing financial incentives to electricity networks to maintain and improve service performance where customers are willing to pay for these improvements.	• Covers reliability and customer service attributes • Targets based on five-year historical performance • Performance is assessed annually and reflected in tariffs with a two-year lag • Incentive rates based on customer willingness to pay • High-powered in that revenue at risk if 5%
Essential Services Commission (ESC) gas GSL scheme	In Victoria, the gas distribution system code requires gas networks to use reasonable endeavours to, at a minimum, meet the guaranteed service levels for tariff V (i.e. residential and small to medium business) customers. If a network fails to meet these service levels for a given customer, then it must make a GSL payment to that customer.	• Low-powered incentive to at least meet minimum service levels across key service attributes • Asymmetrical, as it only penalises and does not reward behaviour by the network

Scheme	Description	Relevant features
UK Ofgem RIIO output incentives	The 'RIIO' framework sets price controls for gas distribution network, which provide revenue allowances (R) based on how networks respond to incentives (I), innovate (I) and achieve various service outputs (O).	• Outputs split into six broad policy areas, with service attributes within each • Range of high-powered incentives applied to each • Targets set either based on historical performance or expectations from allowed expenditure forecasts • Incentive rates based on customer willingness to pay • Performance measured either quantitatively or qualitatively
NZCC default price quality path	The price-quality path for gas distribution networks sets both maximum prices and minimum service quality standards. Although no explicit service quality incentives, the minimum standards are enforceable and incentivise gas distributors to at least match them (to avoid breaking the law).	• No direct financial rewards or penalties, only minimum service quality requirements • Target set based on historical performance • Performance measured using actual data

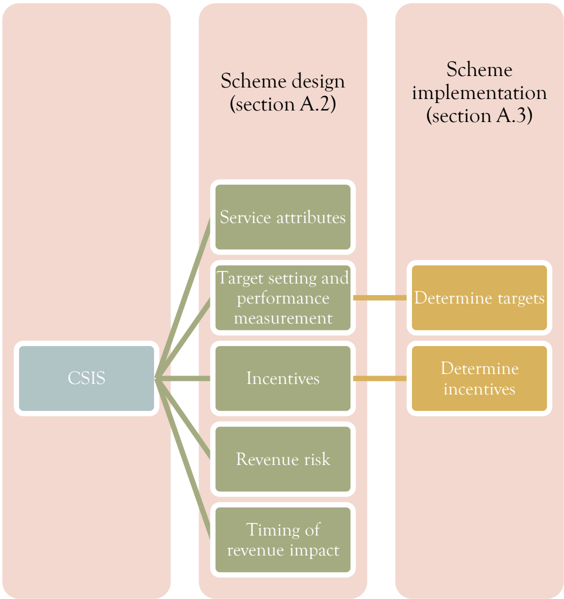
Table 5 – Relevant attributes from other service incentive schemes

Scheme	Relevant attributes	Measure
AER electricity STPIS	Reliability of supply	Unplanned SAIDI Unplanned SAIFI Unplanned MAIFI
	Quality of supply	Not currently applied
	Customer service	Telephone answering
	GSL	Not applied in Victoria (as GSLs already apply)
ESC gas GSL scheme	Reliability of supply	More than 5 or 10 unplanned interruptions per calendar year Interruptions lasting greater than 12 or 18 hours
	Customer service	Appointments missed within 2 hours of scheduled time or missed entirely (either with the customer present or not)
	Customer connections	Connections made after more than 1, 2 or 3 days of the agreed date
Ofgem RIIO output incentives	Customer service	Customer satisfaction Complaints Stakeholder engagement
	Customer connections	Guaranteed standards of performance Facilitation of connection of distributed gas
	Reliability of supply	Loss of supply Network capacity Network reliability Asset health, risk and capacity
NZCC default price quality path	Responsiveness (currently)	Per cent of response time to emergencies within 1 or 3 hours
	Reliability of supply (considering)	Total number of customer minutes lost due to an incident affecting a sufficiently large number of customers

A.2 Design elements

There are a range of specific mechanism design elements that warrant consideration and deliberate choice. Our approach to considering these elements – and where appropriate, implementing them – is summarised in Figure 5.

Figure 5 – Approach to scheme design



A.2.1 Service attributes

Potential service attributes can be identified from stakeholder feedback, from existing reporting requirements, and from attributes used in incentive schemes that operate in other jurisdictions. This section first shortlists potential service attributes and then selects only those that:

- customers value enough to pay for improvement or to penalise deterioration
- the network can sufficiently control relative to the targets set, such that there is a direct relationship between costs and service outcomes
- are not otherwise sufficiently incentivised (for instance, through existing mandated performance requirements or incentive schemes), and
- there is data available of sufficient quality to set targets for and measure performance over the forthcoming 2018–22 AA period.

Together, these requirements ensure that the selected attributes support the incentives that customers value and networks can respond to, and that align to the design criteria.

After exploring stakeholder feedback, existing reporting requirements and service obligations, and other service incentive schemes, we identified the five potential service attributes shown in Table 6 that cover the range of attributes that customers say they value, or that may provide an important counter-balance to a CESS (or potentially the EBSS). Testing these against the above requirements (as shown in the table), we identify:

- reliability of supply and customer service outcomes (e.g. call centre responsiveness) as the preferred service attributes for a gas service incentive scheme – given that these attributes are either valued by customers or directly counter-balance the CESS, are within the control of management, and can be measured reliably now

- customer satisfaction and the speed of customer connections as service attributes that could be added to the service scheme at the next AA review once the required data is available and verifiable and customer preferences are clearer.

Staggering the adoption of service attributes provides an opportunity to identify appropriate measures for the second set of attributes, while also providing a vision for improving the scheme's coverage over time. It is also important to recognise that other service attributes may become relevant in the future as customer preferences change.

Table 7 then assesses our attribute selection against the design criteria.

Table 6 – Assessment of shortlisted attributes

Service attribute	Customers value?	Within network control?	Can be measured?	Already covered by scheme or mandate?	Include?
Reliability of supply	Yes, most customers want to maintain	Yes	Yes, data captured in various existing reporting	Partially by GSLs for unplanned interruptions	Yes, as provides a direct counter-balance to the CESS
Quality of supply	Unclear, as pressure is fine for most customers and networks already required to maintain it for safety reasons	Yes	Yes, data captured within existing reporting	Yes, Gas Distribution System Code mandated minimum pressure requirements	No, as it is unclear whether customers value pressure, but should monitor for future improvement
Customer satisfaction	Yes, as customer satisfaction measures link directly to the value that customers place on service outcomes	Yes, in most cases, although some customer dissatisfaction due to other parties such as retailers	Yes, provided measure is verifiable	No	Maybe, provided a verifiable data series can be established

Service attribute	Customers value?	Within network control?	Can be measured ?	Already covered by scheme or mandate?	Include?
Customer connections	Yes, new customers make clear that connection times and the process for connecting are important to them	Yes	Partially, measured relative to agreed times, not connection offer date	Partially by GSLs for connections exceeding agreed date	Maybe, if meaningful measure can be tracked
Customer service	Yes, as customers complain when call centre responsive times and other resolutions are slow or inadequate	Yes	Yes	Partially by GSLs for missed appointments	Yes, as customers clearly want this

Table 7 – Choice of number and type of service attributes

Element	Assessment
Preferred design	• Adopt reliability of supply and customer service as the service attributes for the initial version of the service incentive scheme • Consider also proposing that customer satisfaction, customer connections and quality of supply are added to the scheme at the next AA review once the required data is available and verifiable.
Options considered	• A wide range of attributes, similar to that adopted by Ofgem in the 'outputs' component of its RIIO approach to regulation, extending from asset condition and network performance, to customer satisfaction and service • A much narrower, or targeted, range of attributes, similar to that covered by the AER-approved STPIS for Victorian electricity distributors
Criteria	
Proportionate	• Customers value reliability of supply, customer service, and customer connections, while customer satisfaction provides a catch-all measure of performance
Targeted	• Focusing initially on two attributes (and three measures as discussed in section A.2.2) that are not already captured by existing incentive schemes helps focus network activity and reduces complexity • Looking at other attributes in the future gives comfort that other important service outcomes are not lost in the scheme design
Consistency	• Reliability of supply and customer service are the two attributes currently captured by the AER-approved Victorian electricity STPIS
Efficient	• Incentivising reliability of supply and customer service provide an efficient counter-balance to the CESS and EBSS incentives to lower service outcomes

Element	Assessment
Manageable allocation of risk	• The attributes cover a mix of asset and customer service performance that are directly affected by capital and operating expenditure decisions – and therefore are within the control of networks

A.2.2 Target setting and performance measurement

Once attributes are selected it is then necessary to determine one or more performance measures for each. These should reflect the data available and align closely to the service attribute that customers value.

Table 8 identifies possible measures for each attribute and makes several observations about their usefulness. Although the list is not exhaustive, it picks up measures where either some data exists today or where it would be beneficial if there was. Where an established measure already exists from current monitoring or reporting we have included this as the preferred measure (in bold), resulting in the following three selected measures:

- Reliability of supply:
  a) **Measure 1**: average duration of reported leaks
  b) **Measure 2**: unplanned SAIDI
- Customer service:
  c) **Measure 3**: call centre responsiveness.

Table 9 then assesses our measure selection against the design criteria. Targets for each measure are determined in section A.3.1. When setting targets, we suggest using:

- audited or validated data where possible to ensure that it is of sufficient quality to rely on for determining financial rewards or penalties
- five years of historical data, where available, to ensure short-term volatility is smoothed out
- a simple average to avoid unnecessary complexity.

Table 8 – Service attribute measures

Service attribute	Possible measures	Observations
Reliability of supply	• **Average duration of reported leaks**[18] – measured as the response time from leak notification to leak repair • Number of reported leaks per KM of mains • **Unplanned SAIDI**[19] – measured equivalent to electricity STPIS using data currently reported to ESV for all customers	• Duration measure captures network responsiveness in addition to reliability, giving networks some opex levers to affect this measure – it also correlates with the risk of public exposure to gas smells • Although the number of leaks is currently reported to the ESV, the total duration of leak notification to repair is not so internal records are needed to provide this data • Unplanned SAIDI is a direct measure of service reliability and can be measured using readily available data regularly reported to the ESV • Unplanned SAIDI could be adjusted to exclude certain events[20]
Quality of supply	• Number of reported gas pressure incidents	• Measure could be split by geography, or customer type
Customer satisfaction	• Customer effort score (ANS) • Customer satisfaction index (AGN)	• May need to differ by network • Need to ensure that the measures are verifiable
Customer connections	• Time to connect – measured as the time between customer agreement to a connection offer, and that connection being commissioned • Timeliness of connection relative to connection offer – as currently measured for compliance reporting • Reported number of connection disputes.	• Consider separate measures/targets by customer type • Need to confirm data availability and quality prior to locking in a measure

[18] This is measured as the average duration of report leaks per year for priority A and B leaks, measured as the average response time from leak notification to leak repair: [Total duration of leak notification to repair]/[Number of leaks]. Priority A and B leaks are defined in appendix A of the ESV and ESC's *Information specification performance indicators – Requirements for reporting by Victorian gas distribution companies*.

[19] This is measured as the sum of the duration of each unplanned sustained customer interruption (in minutes) divided by the number of customers affected. The equivalent measure for the electricity STPIS divides the duration by the total number of distribution customers.

[20] Potential exclusions could include supply interruptions caused by: a failure of the shared transmission network or gas supplier; a failure of transmission connection assets, except where those interruptions were due to inadequate planning of transmission connections and the gas distributor is responsible for transmission connection planning; or the exercise of any obligation, right or discretion imposed upon or provided for under jurisdictional gas legislation or national gas legislation applying to the gas distributor.

Service attribute	Possible measures	Observations
Customer service	• **Percentage share of calls to the call centre answered within 30 seconds**[21]	• Adopting the same measure as that used for the electricity STPIS also means that the same incentive rate could be appropriate • Could be adjusted to exclude the impact of certain events, as with the unplanned SAIDI measure above • Although data not currently reported to a regulator, ANS does capture it for its gas network and AGN captures nationally in aggregate across its gas networks

Table 9 – Choice of performance measures

Element	Assessment
Preferred design	• Adopt leakage duration and unplanned SAIDI per customer as measures of reliability of supply • Adopt call centre responsiveness as a measure of customer service.
Options considered	• A wide range of measures per attribute, similar to that adopted by Ofgem in the 'outputs' component of its RIIO approach to regulation, extending from customer complaints to qualitative assessment of stakeholder engagement • A much narrower, or targeted, range of performance measures, similar to the four covered by the AER-approved STPIS for Victorian electricity distributors
Criteria	
Proportionate	• Customers value reliability of supply, customer service, and customer connections, while customer satisfaction provides a catch-all measure of performance
Targeted	• Focusing initially on three measures that are not already captured by existing incentive schemes helps focus network activity and reduces complexity
Consistency	• Unplanned SAIDI and call centre responsiveness are two of the four performance measures currently captured by the AER-approved Victorian electricity STPIS
Efficient	• Incentivising reliability of supply and customer service provide an efficient counter-balance to the CESS and EBSS incentives to lower service outcomes

[21] Measured using the same definition as that adopted for the electricity STPIS as the number of calls answered within 30 seconds divided by the total number of calls received that are not abandoned within 30 seconds. The duration of a call is measured from when it enters the telephone system of the call centre (including the time when it may be ringing unanswered by any response) and the caller speaks with a human operator, but excluding the time that the caller is connected to an automated interactive service that provides substantive information. This excludes calls to payment lines and automated interactive services.

Element	Assessment
Manageable allocation of risk	• The performance measures cover a mix of asset and customer service performance that are directly affected by capital and operating expenditure decisions – and therefore are within the control of networks

A.2.3 Incentives

Performance measures are used to set targets and assess performance against them. Incentive rates are then used to map performance onto financial rewards or penalties, which we do using the following formula for each measure (which is similar in effect to how the AER's electricity STPIS operates):

$$[Performance - Target] \times [Incentive\ rate] \times [Annual\ revenue]$$

This formula multiplies the difference between actual and targeted performance by an incentive rate that applies to annual revenue. Where higher performance is preferred (e.g. call centre responsiveness), the incentive rate is positive. Where lower performance is preferred (e.g. unplanned SAIDI), the incentive rate is negative. This ensures that the right behaviour is incentivised.

This sub-section assesses approaches that *could* be used to determine incentive rates and identifies our preferred. We recognise that other approaches could be used in some cases, especially if better data on customers' willingness to pay for certain service outcomes were available. We also recognise that these could be applied asymmetrically or with caps, which we consider further in section A.2.4.

Our starting point is to, where possible, rely on customer willingness to pay to determine incentive rates. In theory, this makes it easier for networks to appropriately balance the cost of delivering service outcomes with the value customers place on it. In practice, however, such value can be hard to determine. It is also important to recognise that the value of the incentive rate affects the incentive power of the scheme. The higher the rates, the greater the incentive and vice versa. Although one could scale the incentive rates above or below that based on customer willingness to pay to affect the incentive power, we do not consider this appropriate until it is clearer how networks can and do respond.

Specifically, we use:

1. the assumed value of avoiding a gas smell to determine an incentive rate for gas leakage that avoids duplicating:
    a) the value that customers place on reducing the duration of outages (as picked up in the unplanned SAIDI measure), or
    b) the economic value of escaped gas as captured by the existing unaccounted for gas (UAG) incentives
2. the value of lost load (VoLL) for gas codified in the NGR to determine the incentive rate for unplanned SAIDI

3. the incentive rate used in the electricity STPIS for call centre responsiveness.

Our preferred approaches to determining incentive rates is set out in **Error! Reference source not found.**, and these are tested against the design criteria in **Error! Reference source not found.**. Incentive rates for the 2018-22 AA period are then determined in section A.3.1.

Table 10 – Incentive rate approaches

Measure	Preferred approach	Observations
Gas leakage duration	• Calculate an incentive rate for the amenity value of avoiding gas smells as: $$IR = \frac{VoAS \cdot E \cdot L}{R}$$ • Where: – IR is the incentive rate – $VoAS$ is the value of avoiding a gas smell per exposure – E is the assumed number of customer / public exposures to gas smells per minute of gas leaks – L is the average annual duration (in minutes) of gas leaks measured from leak notification to leak repair – R is the average of the smoothed annual revenue requirement for the relevant regulatory period.	• Identifying an incentive rate is challenging because there is some overlap between repairing leaks and the unplanned SAIDI measure, or the value of gas reflected in the UAFG incentive • To ensure that there is no duplication of incentives, the incentive rate for leakage responsiveness should reflect the amenity value of reducing the smell of gas leaks (i.e. odours) and / or improving safety – values that are not captured by the unplanned SAIDI or UAFG incentives • This incentive rate is calculated to reflect the value that customers (and members of society more generally) place on avoiding gas smells. The calculation is based on two assumptions: (1) the value that society places on avoiding a gas smell and (2) the number of exposures to gas smells for a given duration of leak. Using these assumptions, the formula calculates the expected value from avoiding all leaks in a given year and scales this by the expected revenue for that year. The incentive rate is then applied to the average duration of leaks in a given year.

Measure	Preferred approach	Observations
Unplanned SAIDI	• Calculate an incentive rate as: $$IR = \frac{VoLL \cdot C}{R \cdot 365.25 \cdot 24 \cdot 60} \cdot 100$$ • Where: – IR is the incentive rate – $VoLL$ is \$800 per GJ – C is the average annual gas consumption for the network in GJs – R is the average of the smoothed annual revenue requirement for the relevant regulatory period	• The electricity STPIS determines an incentive rate for SAIDI using a value of customer reliability (VCR), which represents the value that customers place on supply reliability • The best available gas equivalent is the VoLL, which is a mechanism in the Victorian declared wholesale gas market to signal the value of gas that is demanded but not supplied.[22] VoLL is currently set at \$800 per GJ,[23] although further work could be done to refine this value. • This incentive rate is calculated to reflect the value placed on lost load by customers affected by a supply disruption. The calculation is based on one assumption: the value of lost load per GJ of \$800 (as set out in the NGR r 200). Using this assumption, the formula calculates the expected value from avoiding all supply disruptions in a given year and scales this by the expected revenue for that year. The incentive rate is then applied to the average duration of supply disruption for all customers in a given year.
Call centre responsiveness	• Adopt the incentive rate: $$IR = 0.0004$$	• The equivalent default incentive rate used for the electricity STPIS of 0.04% per unit of the telephone answering parameter (i.e. per percentage point above or below the target) • Assuming that gas and electricity customers place a similar value on call centre responsiveness and provided there is no evidence to the contrary (which we do not have), it is appropriate to adopt the same incentive rate for the gas STPIS

[22] Voll is operative in the following circumstances: If a pricing schedule determines that injections and withdrawals of gas imply that curtailment would have occurred (whether or not curtailment actually occurs), the market price for that scheduling horizon is equal to VoLL. (s223 Part 19, Declared Wholesale Gas Market Rules, National Gas Rules Version 29).

[23] See the 'VoLL' definition at rule 200 of the National Gas Rules. Given the value is hard-coded into the rules as a nominal value, there is no basis to determine whether and how to adjust it for inflation. Further work could be done to look into this.

Table 11 – Choice of incentive rate methods

Element	Assessment
Preferred design	• Calculate incentive for unplanned SAIDI based on VoLL and gas leakage duration based on VoAS, which both attempt to measure customer willingness to pay • Adopt the same incentive rate for call centre responsiveness as that used in the electricity STPIS
Options considered	• Base incentive rates on customer willingness to pay • Scale rates to increase or decrease incentive power
Criteria	
Proportionate	• Using customer willingness to pay aligns neatly with customer value
Targeted	• Adopting one incentive rate for each measure focuses network attention on expenditure decisions that directly affect the corresponding performance measure
Consistency	• Incentive rates for unplanned SAIDI and call centre performance align directly with those used in the electricity STPIS
Efficient	• Incentive rates are expressly designed to incentivise efficient behaviour, provided they are set at efficient levels • Scaling can be used in the future if the incentive power turns out to be either too strong or weak
Manageable allocation of risk	• Clearly identified incentive rates help networks quantify the risk and opportunities they face under the incentive scheme

A.2.4 Revenue at risk

Network behaviour is affected by the risk (and opportunity) faced and the ability to manage it. Under an incentive scheme revenue at risk depends on:

1. the gap between actual and targeted performance – discussed in section A.2.2
2. the incentive rates adopted – discussed in section A.2.3
3. whether the scheme is symmetrical in general or for specific performance measures
4. whether there are any caps on the financial penalties or rewards overall or for specific performance measures.

This section considers the last two elements. Our preference is for the scheme to be symmetrical with a 1% revenue cap on overall rewards and penalties each year, a 0.5% revenue cap on call centre rewards and penalties, and only penalties available for the unplanned SAIDI measure.

Symmetry

The choice of whether or not to adopt a symmetrical design depends on how well targeted the scheme incentives are relative to:

- customers' expectations and willingness to pay, and
- networks' prior performance.

There is no clear customer preference for funding further reliability *improvements*, although there is a preference to not let reliability drop. Reliability may also need to be included as an attribute to provide sufficient counter-balance to the CESS, as noted by the AER. Therefore, we consider it preferable applying the STPIS asymmetrically for this performance measure, penalising poor performance but not rewarding good performance.

There does not, however, appear to be the same customer resistance to rewarding improvements in call centre performance and the duration of gas leaks. As such, we suggest applying the STPIS symmetrically to these performance measures, at least until customer preferences become clearer. Our preferred symmetry design is tested against the design criteria in Table 12.

Table 12 – Choice of symmetry of incentives

Element	Assessment
Preferred design	Determine separately for each service attribute • Leaks – Symmetrical • Unplanned SAIDI – Asymmetrical • Call centre – Symmetrical
Options considered	• Reward improvement and penalise deterioration—i.e. *maintain* or *improve* • Only penalise • Only reward
Criteria	
Proportionate	• Unplanned SAIDI – Customer feedback has shown happiness with current reliability, and no clear willingness to pay for reliability improvements above the historically high performance. It was however generally agreed that a counterbalance to the CESS was required, hence an asymmetrical measure is needed at a minimum. • The same does not apply to leaks or call centre responsiveness, where customers value improvement. For instance, customers place a high value on safety and some value on the public amenity of not smelling gas, and so would likely support improving the speed at which leaks are repaired.
Targeted	• Historical performance suggests targeting is best achieved through asymmetrical planned SAIDI, whereas both call centre performance and responsiveness to leaks can afford to be improved as well as being incentivised not to decline. • Because the gas value of leakages is captured in the UAG incentive, the incentive rates for the responsiveness to leaks attribute must only reflect the public/customer amenity cost of leaks to avoid double-up of incentives.
Consistency	• This is not consistent with the AER's electricity STPIS, which applies each performance measure symmetrically, but does align with AER feedback for gas.
Efficiency	• Symmetry promotes efficiency because it allows for continuous offsetting incentives between outcomes and costs • Although this does not apply to the same degree with an asymmetrical unplanned SAIDI measure, this better reflects customer preferences.

Element	Assessment
Manageable allocation of risk	• It is likely that networks have sufficient ability to affect call centre performance, unplanned SAIDI and gas leakage responsiveness, in part based on the variation experienced over time and direct link to expenditure decisions

Caps

In addition to the choice on symmetrical design, capping revenue adjustments is a key way to protect risk for both the networks and their customers, in particular, as this new scheme is transitioned in. The AER allows electricity networks to nominate caps for aggregate STPIS rewards or penalties at either +/- 1% or +/- 5% of annual allowed building block revenues.

As a starting point for the STPIS, we consider it prudent to apply an aggregate +/-1% of revenues cap for 2018-22 AA period, as well as a specific customer service measure cap of +/- 0.5% to reflect both AER and Ofgem precedent for this service attribute. This cap also appears sensible when compared to the capital expenditure saving needed to affect 1% of revenues, noting that:

- the CESS ensures that there is a 30 cent benefit in NPV terms for every $1 of capital expenditure saving, made up of a financing cost saving within period plus a residual revenue carryover into the next regulatory period
- to ensure that the benefit is greater than or equal to 1% of revenues, the annual capital expenditure reduction must be greater than or equal to 1%/30% = 3.3% of annual revenues
- therefore, for a network with $100M in annual revenue, $3.3M needs to be saved to offset a $1M STPIS penalty using the CESS and vice versa.

Our preferred cap design is tested against the design criteria in Table 13.

Table 13 – Capping incentive revenue adjustments

Element	Assessment
Preferred design	Both aggregate scheme cap at +/-1%, and cap call centre performance measure at +/- 0.5%
Options considered	• Open impact based on incentive rates and targets • ‘Cap and collar’ on total incentive impact • Cap by service attribute
Criteria	
Proportionate	• Capping the total STPIS impact at 1% is consistent with this being a new and untested mechanism, so neither customers nor networks should face higher risk of revenue adjustments.
Targeted	• The 1% cap appears to sensibly balance the CESS incentive; however more work might be needed to validate this, especially once network behaviour in response to the STPIS is assessed over time.
Consistency	• AER and OFGEM precedents include specific attribute caps e.g. 0.5% on some customer service measures, and AER applies 0.5% on call centre performance

Element	Assessment
Efficiency	• Although caps potentially constrain the effectiveness of incentives, they do help manage the risk faced by both networks and customers – which can encourage more efficient behaviour especially if factors outside of the networks control affect performance measures (such as weather effects on unplanned SAIDI of electricity networks)
Manageable allocation of risk	• Constrains commercial risk for networks and price risk for customers

A.2.5 Timing of revenue impact

The last key element of STPIS design is the timing of when revenues are adjusted to reflect the financial rewards or penalties resulting from good or poor performance. This timing will affect the level of additional regulatory burden for both the gas networks and the AER in applying the STPIS.

We consider it preferable to perform the incentive calculation and revenue adjustment at the AA review every five years. This aligns with when the CESS and EBSS incentive calculations are (or are expected to be) done, and minimises regulatory burden. There are no obvious reasons for adopting a mechanism – such as the electricity STPIS – that makes revenue adjustments more frequently. Although not required, the current electricity STPIS does make more frequent revenue decisions in part based on how the equivalent jurisdictional schemes operated prior to the NER applying.

Table 14 assesses our preferred design against the design criteria. Section A.4 provides a pro forma for how the STPIS true-up could operate every five years, in a similar format to how the CESS true-up mechanism works.

Table 14 – Choice of when to apply incentive outcomes

Element	Assessment
Preferred design	At AA review, every five years
Options considered	• Within period with lag between reporting year and tariff adjustment • At AA review
Criteria	
Proportionate	• Aligns with the CESS and EBSS incentive calculations, and minimises regulatory burden (i.e. the administrative costs of implementing the scheme)
Targeted	• Appropriated aligned with CESS and EBSS
Consistency	• This approach is consistent with the electricity EBSS and CESS, but not the electricity STPIS for the reasons explained below
Efficiency	• This approach also aligns the timing of when penalties and rewards are realised EBSS, CESS and STPIS incentive schemes, which avoids any unintended inefficiency resulting from misalignment
Manageable allocation of risk	• Networks have a longer lead time to manage the revenue implications of incentive performance outcomes and can smooth revenue impacts over the subsequent AA period, similar to what is done for the EBSS and CESS

Consistency

While the incentive impact of within period rewards/penalties as apply to electricity networks can be argued to be stronger—i.e. because the revenues are earned in more real-time fashion (albeit lagged to allow time for reporting actual performance)—it is not clear that the incentive for service performance for gas networks needs to be stronger than that of the CESS and EBSS given that these networks currently do not face any STPIS-type incentives but do face an EBSS.

Further, within period adjustments to revenue for service outcomes may make sense where targets are endogenous and change within period as this ensures that network incentives are revised in a real-time fashion, as was the case under the former ESC electricity S factor scheme. However, there is less logic in this under the AER's STPIS targets that are locked in for 5 years based on historical performance.

Other requirements

Fixed principle – We note that under either design, a fixed principle will be needed in networks' AAs to preserve the multi-period effect of the incentive scheme. For example, this will be equivalent to the fixed principles for the EBSS in clause 7.2(a)(3) of ANS's current AA.

End of AA period data availability – Because AA revision determinations are (generally) made prior to the end of the current AA period, actual service performance for the final year of the regulatory control period will not be available when calculating the STPIS rewards or penalties. Similarly, year 4 data will not be known at the time of AA revision submission, although these will likely be known by the time of the determination (much like year 4 opex, which is typically used to determine next AA period opex allowances).

The STPIS will need a method of addressing this when calculating incentive rewards. Equivalent schemes deal with this in different ways:

- *Estimate now and adjust later* – The AER's CESS uses an estimate for year 5 actual capex and adjusts for this at the next AA review.[24] This means that the estimates used at the time of the network's revised regulatory proposal can be used.
- *Lag the measurement period* – The capex ex post review provisions of the National Electricity Rules (NER)[25] use a 5-year period that comprises years 4 and 5 of the prior regulatory period and years 1-3 of the current regulatory period. This means that only actual data known at the time of the networks regulatory proposal is used.

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[24] See AER, Capital Expenditure Incentive Guideline, Nov 2013, section 2.4.

[25] NER S6.2.2A.

- *Estimate and align forecasts* – The AER's EBSS relies on an estimate of final year opex that is developed consistent with the forecasting method for setting allowances into the next regulatory period.[26] This method is therefore not relevant to a STPIS design (given a different method is proposed to set the STPIS targets).

We consider the simplest option is option 2. This is also consistent with how the AER sets the performance target for the electricity STPIS. We further consider that only a one-year lag is needed (i.e. use year 5 of the prior period and years 1–4 of the current period if a five-year average is used).

A.3 Scheme implementation

This section calculates indicative targets and incentive rates for the networks to apply our preferred STPIS design over the 2018-22 AA period. These are calculated using the definitions and approaches identified in sections A.2.2 and A.2.3.

A.3.1 Targets

The key to setting targets for each performance measure using historical data is to ensure that data is of sufficient quality. We worked with AGN and ANS to collect this data, relying on that provided to the ESV where possible. We also recognise that the availability, quality and time-period of data could be improved with more investigation of systems and over time.

Table 15 and Table 16 identify the resulting indicative targets for AGN and ANS respectively, noting the data and calculation method used. Some targets differ materially between the two networks – in part due to different network operating environments and potential variation in data collection approaches – which underpins the importance of adopting network-specific targets, such as is done for the electricity STPIS and other schemes and as we do here for the Victorian gas STPIS. In the future, the data used to assess performance could be audited to provide customers, the AER and other stakeholders with comfort in any rewards or penalties that would result if a STPIS were applied.

[26] See AER, Efficiency Benefit Sharing Scheme, November 2013, section 1.3.4.

Table 15 – Indicative targets for AGN

Measure	Data source	Calculation method	Indicative target
Unplanned SAIDI	Gas supply lost (in minutes) and total number of customers for the company as a whole, as reported to the ESV. The time period covers January 2012 to June 2016.	Aggregate the quality data into annual values and divide the gas supply lost (in minutes) by the number of customers for each year to get an annual unplanned SAIDI value for customers. A simple average across available years is then used to determine the target.	3.680 minutes per customer.
Gas leakage responsiveness	Number and total duration of priority A and B leakage repairs as captured in AGN' internal incident recording systems (Maximo up to August 2015 and EAM after). Duration is measured as the time between when a leak was first identified in the system to when the affected site was completed. Leak repairs left open for longer than 36 hours for priority A leaks and 10 days for priority B leaks were removed.	Divide the total duration of leaks for a given year by the number of leaks in that year. A simple average across available years is then used to determine the target.	177.112 minutes per priority A and B gas leak
Call centre responsiveness	Number of answered within 30 seconds and total calls received (excluding those abandoned within 30 seconds) as captured monthly within AGN's national call centre systems. The time period covers September 2014 to September 2016.	Aggregate the monthly data into annual values and divide the number of calls answered within 30 seconds by the total calls received for each year to get the share of calls answered within 30 seconds. As only national data is available, this is assumed to apply equally to AGN's Victorian network. A simple average across available years is then used to determine the target.	77.448% of calls answered within 30 seconds.

Table 16 – Indicative targets for ANS

Measure	Data source	Calculation method	Indicative target
Unplanned SAID	Gas supply lost (in minutes) and total number of customers for the company as a whole, as reported to the ESV. The time period covers January 2011 to September 2016.	Aggregate the quality data into annual values and divide the gas supply lost (in minutes) by the number of customers for each year to get an annual unplanned SAIDI value for customers. A simple average across available years is then used to determine the target.	0.871 minutes per customer.
Gas leakage responsiveness	Number and total duration of priority A and B leakage repairs as captured in ANS' internal incident recording systems. Duration is measured as the time between when a leak was first identified in the system to when the affected site was made safe. Data that suggests a negative or indeterminate duration was excluded.	Divide the total duration of leaks for a given year by the number of leaks in that year. A simple average across available years is then used to determine the target.	106.558 minutes per priority A and B gas leak.
Call centre responsiveness	Number of answered within 30 seconds and total calls received (excluding those abandoned within 30 seconds) as captured monthly within ANS's call centre system for its gas network specifically. The time period covers October 2011 to October2016.	Aggregate the monthly data into annual values and divide the number of calls answered within 30 seconds by the total calls received for each year to get the share of calls answered within 30 seconds. A simple average across available years is then used to determine the target.	82.945% of calls answered within 30 seconds.

A.3.2 Incentive rates

The final step is to determine incentive rates for each performance measure, which again are network-specific.

Table 17 and Table 18 calculate the incentive rates for unplanned SAIDI and gas leakage duration respectively, which are both treated as negative rates (e.g. an increase in unplanned SAIDI results in a penalty and vice versa). These vary between the networks due to slightly different network characteristics and historical performance. Values for annual gas throughput and annual revenue could be updated to reflect those forecast (or allowed) for the 2018–22 AA period to improve the incentive rate estimates.

The incentive rate for call centre responsiveness is set to 0.04% per unit of performance, as per the electricity STPIS, which is treated as a positive rate (i.e. so an increase in responsiveness results in a reward and vice versa).

Table 17 – Indicative incentive rates for unplanned SAIDI

Parameter	AGN	ANS	Data source
Value of lost load, $2016 (A)	$800 per GJ	$800 per GJ	Sourced from NGR rule 200
Forecast annual gas throughput (B)	55,962,000 GJ	67,551,000 GJ	2015 actual gas throughput from RIN responses submitted to the AER
Minutes per year (D)	525,960	525,960	365.25 days x 24 hours x 60 minutes
Forecast annual revenue, $2016 (E)	$181,300,000	$166,900,000	2015 actual revenue from RIN responses submitted to the AER
Indicative incentive rate	**4.695%**	**6.156%**	**Calculated as (A x B) / (D x E)**

Table 18 – Indicative incentive rates for gas leakage duration

Parameter	AGN	ANS	Data source
Value of avoiding gas smell exposure, $2016 (A)	$1 per exposure	$1 per exposure	Based on initial research into the willingness to pay of people to avoid exposure to diesel gas fumes.[27] Further work is needed to validate this assumption.

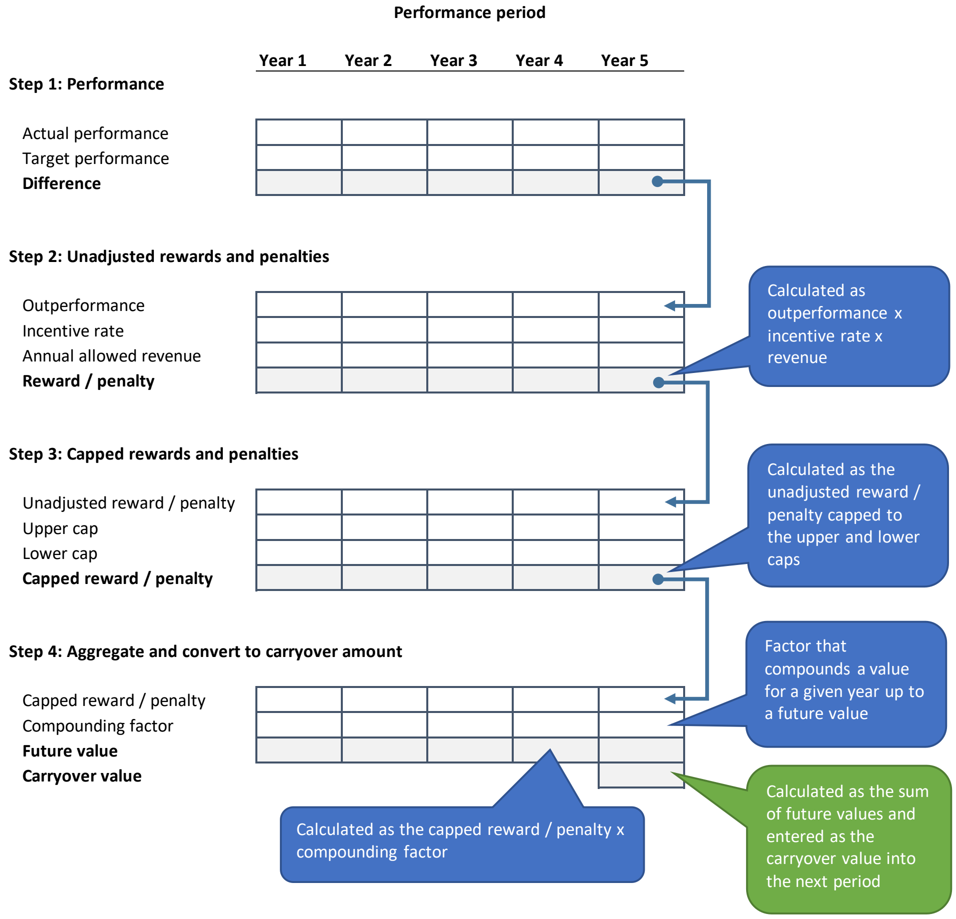
[27] One 1987 US study of diesel gas odours estimates a willingness-to-pay of between US$0.11 and US$0.40 per exposure to odour. In today's terms this is about US$0.23 to US$0.85 per exposure, or $0.30 to $1.12 in Australian dollars. This supports a rounded value of $1 per exposure, which recognises the imprecision of the estimate – although we recognise that an alternative value could be used. See Thomas J. Lareau and Douglas A. Rae, 1989, *Valuing WTP for diesel order reductions: An application of contingent ranking technique*, Southern Economic Journal, Vol. 55, No. 3, pp. 728–742.

Parameter	AGN	ANS	Data source
Exposures per minute of gas leak (B)	0.08	0.08	Based on the assumption that there are five exposures per hour. Further work is needed to validate this assumption.
Annual duration of priority A and B gas leaks (C)	2,341,109	2,039,285	Calculated as the average monthly duration across the months where data is available – and as used to determine the gas leakage target – divided by 12
Forecast annual revenue, $2016 (D)	$181,300,000	$166,900,000	2015 actual revenue from RIN responses submitted to the AER
Indicative incentive rate	**0.108%**	**0.102%**	**Calculated as (A x B x C) / D**

A.4 Carryover mechanism

Figure 6 provides an example of a carryover mechanism that could be used to convert actual performance over a period into a carryover reward or penalty to feed into allowed revenues for a subsequent regulatory period. The example is simplified in that it applies to only one performance measure, but can be easily adapted to apply to the three measures suggested for the initial STPIS design.

Figure 6 – Example carryover mechanism



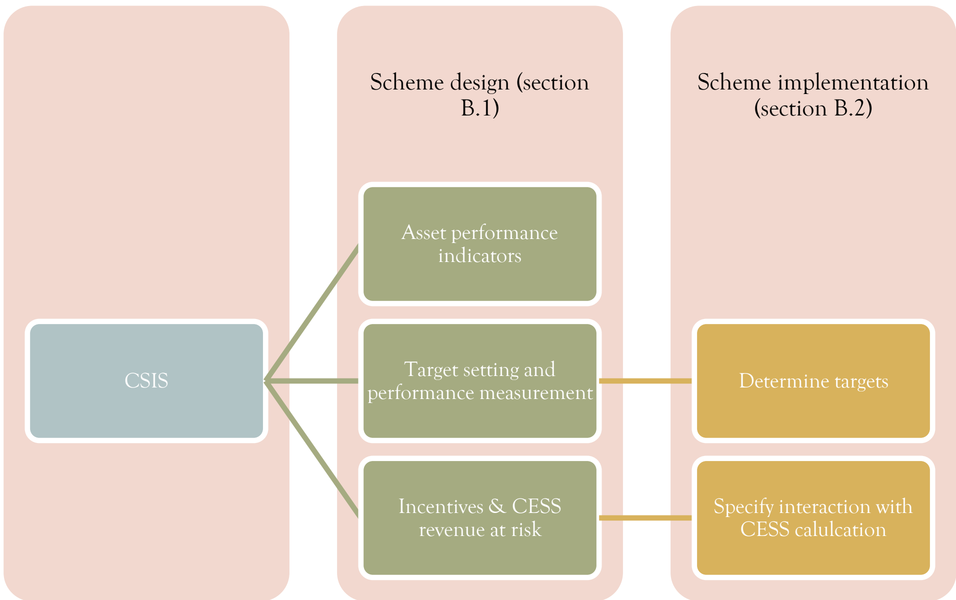
Appendix B - Contingent payments design

This appendix set out our assessment of and preferred contingent payment design based on the information available at this time. Similar to our preferred design for the STPIS, our preferred design for the contingent payment mechanism includes indicative scheme parameters to give effect to it that could be used if it were adopted.

B.1 Design elements

There are a range of specific mechanism design elements that warrant consideration and deliberate choice. Our approach to considering these elements – and where appropriate, implementing them – is summarised in Figure 7.

Figure 7 – Approach to contingent payment scheme design



B.1.1 Asset performance indicators

Per our terms of reference, the asset performance indicators that we adopt are:[28]

1. Reliability of supply – unplanned SAIDI per customer per year – which measures the average duration (in minutes) of unplanned service disruptions averaged across all customers (which is the same as that adopted for the STPIS design in Appendix A)

[28] As discussed in section B.2, we apply these measures to July to June financial years rather than calendar years due to the availability of data. In future, once sufficient data was available, these could be applied to calendar years, consistent with AGN's and ANS' regulatory years.

2. Gas leaks – which measures the number of publicly reported gas leaks in mains, services or meters that require corrective works per year
3. Water in mains – which measures the number of instances of water seeping into the network through degraded pipe assets per kilometre of network per year.

These measures are drawn from the networks' respective asset integrity plans and AA KPIs. While these plans also include monitoring for unaccounted for gas (UAFG), because the networks already have UAFG minimisation incentives under the regulatory regime, we have excluded this measure from the index

Reliability of supply is a direct measure of service reliability and can be measured using readily available data regularly reported to the ESV.

Monitoring gas leaks is consistent with the findings of the networks' customer engagement, which observed that customers:

> *view gas as a reliable source of energy and value the current standard of reliability*
>
> *they support initiatives to maintain that reliability and improve network safety and reduce leaks, although it is not clear that they value improving reliability*[29]

Water in mains is a key integrity measure for the networks' mains replacement programs. These replacement programs are the largest discretionary element of the capex forecasts for the next AA period for both networks. This measure, therefore, provides a targeted counterbalance incentive for investment deferral within these programs.

B.1.2 Target setting and performance measurement

Drawing on data available, Table 19 identifies measures for each asset performance indicator and makes several observations about their usefulness. Although the list is not exhaustive, it picks up measures where either some data exists today or where it would be beneficial if there was. Where an established measure already exists from reporting and is fit for CESS purposes, we have adopted this as our preferred measure (in bold).

Targets for each measure are determined in section B.2.1. As with the STPIS, when setting targets, have sought to use:

1. audited or validated data where possible to ensure that it is of sufficient quality to rely on for determining financial rewards under the CESS
2. five years of historical data, where available, to ensure that short-term volatility is smoothed out

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[29] Deloitte, *Australian Gas Networks Customer Insights Report, Victorian and Albury Stakeholder Engagement Program*, May 2016, insights 6 and 7.

3. a simple average of historical annual data to avoid unnecessary complexity.

Table 19 – Asset performance indicators

Asset performance indicator	Possible measures	Observations
Reliability of supply	• Average duration of reported leaks[30] – measured as the response time from leak notification to leak repair • **Unplanned SAIDI**[31] – measured equivalent to electricity STPIS using data currently reported to ESV, but for all customers	• Duration is not adopted because it captures responsiveness – which is operating in nature – in addition to asset reliability • Unplanned SAIDI is a direct measure of service reliability and can be measured using readily available data regularly reported to the ESV • Unplanned SAIDI could be adjusted to exclude certain events[32]
Leaks	• **Measured as all leaks across mains, services, and meters** • Measured at a sub-set of assets	• Measuring across all asset types gives a more robust measure of asset performance • Historical time-series data is collected for Australian Energy Council annual gas benchmarking reports[33]
Water in mains	• **Number of reported water in mains incidents** • Number of reported water in mains incidents per km of low-pressure mains	• Although water in mains tends to only affect the low-pressure system, the data is not available for both AGN and ANS to report this measure per km of low-pressure mains • The effect of this is unlikely to be material provided the mix of low-pressure mains to all mains does not change materially over time – which is a reasonable assumption given limited network growth is forecasted

[30] This is measured as the average duration of report leaks per year for priority A and B leaks, measured as the average response time from leak notification to leak repair: [Total duration of leak notification to repair]/[Number of leaks]. Priority A and B leaks are defined in appendix A of the ESV and ESC's *Information specification performance indicators – Requirements for reporting by Victorian gas distribution companies*.

[31] This is measured as the sum of the duration of each unplanned sustained customer interruption (in minutes) divided by the number of customers affected. The equivalent measure for the electricity STPIS divides the duration by the total number of distribution customers.

[32] Potential exclusions could include supply interruptions caused by: a failure of the shared transmission network or gas supplier; a failure of transmission connection assets, except where those interruptions were due to inadequate planning of transmission connections and the gas distributor is responsible for transmission connection planning; or the exercise of any obligation, right or discretion imposed upon or provided for under jurisdictional gas legislation or national gas legislation applying to the gas distributor.

[33] For instance, ENA and Australian Energy Council, *Natural gas distribution benchmarking report 2014-15: report for AusNet Services*, 2015.

While it would be possible to adopt different weights across these measures, customer willingness to pay data or any other rationale is not available to suggest that this complexity is warranted. Therefore, a simple 1/3 weighting for each measure has been adopted.

B.1.3 Incentives and CESS reward at risk

The amount of CESS reward at risk – or additional upside available – will be a key determinant of the incentive power of the contingent payment approach and how fit-for-purpose it is for counterbalancing the CESS in the next AA period.

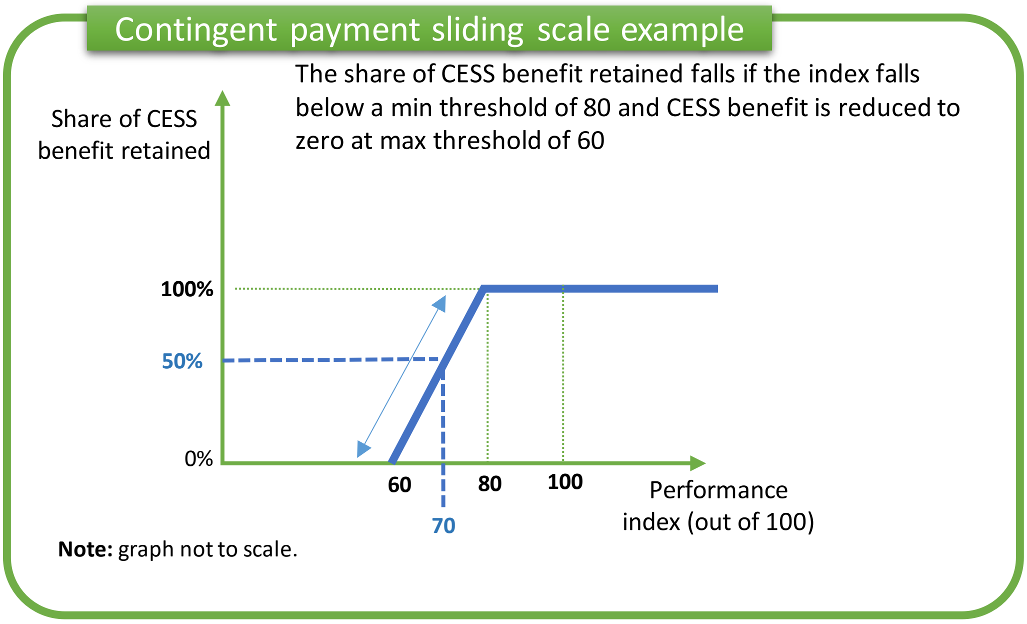
There are a range of approaches to designing the asset performance index, including:

1. an index where measures are weighted and scaled, through to
2. a simple banding approach (e.g. good, acceptable, poor).

We use the weighted and scaled index approach on the basis that a banding approach will require the exercise of judgement (e.g. in setting bands) and this will therefore likely introduce significant complexity and potentially uncertainty for stakeholders and the networks.

This approach is illustrated in Figure 8, showing that with index thresholds of 80 and 60, an index outcome of 70 would result in the gas network receiving only 50% of its available CESS benefit.

Figure 8 – Contingent payment sliding scale



The index is calculated as the simple average of indices calculated for each of the three measure as follows:

200 – [Actual performance]/[Target performance] x 100.

Here, [*Actual performance*] is average performance over the 2018–21 financial years and [*Target performance*] is as determined in Table 21 and Table 22 for AGN and ANS respectively. The calculation is designed so that an improvement in performance results in a higher index score and vice versa, while ensuring that the index has a base of 100 relative to the target performance. We recognise that alternative approaches could be used to calculate a performance index and have not considered these here.

To apply a scaled approach it is necessary to determine index thresholds for when the scale starts and finishes. Several approaches could be used to do this. Setting these thresholds will necessarily involve some level of judgement.

Stakeholders valued currently reliability, which lends support to approaches that are based on historical performance and variance therein. For instance, using probability theory, the thresholds could be calculated by first determining thresholds for each measure, in index terms, and then combining these into a single threshold using the same 1/3 weights used to determine the performance index. The thresholds for each measure could be calculated by using the sample standard deviation of past performance and converting this into confidence intervals around the target performance, based on either the probability of an observation falling outside those intervals or by using a fixed multiple of those standard deviations.

Preliminary analysis suggests that the minimum threshold could fall between 70–90 and the maximum threshold could fall between 60–70 for the two networks. From these ranges a minimum threshold could be 80 and a maximum threshold of 60. While we note that further work would be needed if more precise threshold values were considered necessary for scheme design, given this is a new scheme, such analysis may be unwarranted provided the businesses are not penalised for performance that aligns to their historical performance.

Table 20 sets out our preferred design and applies the design criteria.

Table 20 – Choice of incentives and CESS reward at risk

Element	Assessment
Preferred design	• Apply the contingent payments asymmetrically (i.e. it can only reduce CESS rewards) • Apply a sliding-scale to reduce CESS rewards where KPI targets are not met on average over the 2018-21 (four year) period • Adopt a tolerance band, where KPI performance below a minimum threshold reduces any CESS rewards up to 100% once a maximum threshold is hit • Set the minimum and maximum thresholds using an approach based on customer expectations, perhaps by using probability theory to turn past performance into statistical thresholds for future performance (for instance the 80 and 60 values noted above)

Element	Assessment
Options considered	The contingent payment of CESS incentives could be: • *Symmetrical sliding scale* - CESS rewards and penalties are scaled up or down based on performance relative to the index • *Asymmetric sliding scale* - not meeting targets by X% results in a Y% deflator on CESS rewards. • *Binary* – not meeting a pre-determined asset performance threshold disqualifies any CESS reward. • *Dead-band* - establish a tolerance within which no CESS reduction is applied, with the band based on observed historical variance in the chosen measures. • *Reward at risk* - the contingent effects of the index on CESS payments could also be applied to 100% of CESS, or something less, say 50%.
Criteria	
Proportionate	• Asymmetry best aligns with customers stated unwillingness to pay for reliability improvements • Sliding scale, applying to 100% of CESS value, and with a dead-band ensures incentives are maintained whilst being aligned to the adequacy of the KPI performance.
Targeted	• Adopting capex-centric measures and applying the KPIs asymmetrically keeps the schemed targeted at CESS counterbalancing.
Consistency	• Contingent payment approach is not consistent with the electricity STPIS • Dead-band concept is consistent with the major event day exclusions in the electricity STPIS.
Efficient	• Asymmetric scaling ensures cost efficiency incentives are not excessive, whilst recognising customers' preferences for not rewarding reliability improvements.
Manageable allocation of risk	• Asymmetric scaling ensures risks of the CESS are constrained within the CESS mechanism and cannot generate additional service improvement incentive payment risks for customers who are unwilling to pay for this.

B.2 Scheme implementation

This section calculates indicative targets for the networks to apply our preferred contingent payment approach design over the 2018-22 AA period. These are calculated using the definitions and approaches identified in section B.2.1. Section B.2.2 then outlines the CESS formula inclusive of the contingent payment calculation.

B.2.1 Targets

When setting targets for each asset performance indicator using historical data, we worked with AGN and ANS to test robustness of the available data. We worked closely with AGN and ANS to collect this data, relying on that provided to public bodies such as the ESV where possible and the Australian Energy Council. As with our STPIS data investigations, we recognise that the time-period for which data is available and the quality of data will improve over time.

Table 21 and Table 22 identify the resulting indicative targets for AGN and ANS respectively, noting the data and calculation method used. Some targets differ materially between the two networks – in part due to different network operating environments – which underpins the importance of adopting network-specific targets, such as is done for the electricity STPIS and other schemes and as we also adopt here for the contingent payments design.

Table 21 – Indicative targets for AGN

Measure	Data source	Calculation method	Indicative target
Unplanned SAIDI	Gas supply lost (in minutes) and number of total customers as reported to the ESV quarterly or captured in internal records. The time period covers July 2010 to June 2015.	Aggregate the monthly data into July to June financial year values and divide the gas supply lost (in minutes) by the average number of customers for each year to get an annual unplanned SAIDI. A simple average across available years is then used to determine the target.	3.694 minutes per customer per year
Reported gas leaks	AGN data provided for the Australian Energy Council's annual gas distribution benchmarking report. This report reports data on a July to June financial year basis. The time period is July 2010 to June 2015.	Aggregate all leaks reported across mains, services, and meters for the relevant financial year. A simple average across available years is then used to determine the target.	13,854 leaks per year

Measure	Data source	Calculation method	Indicative target
Water in mains	AGN water in main data provided for the Australian Energy Council's annual gas distribution benchmarking report. AGN main length data provided for the Annual Information Specification Performance Indicator Report. The time period is July 2010 to June 2015. Main length data reported as at 31 December for the relevant financial year.	Aggregate water in main incidents for a given July to June financial year divided by total pipeline length as at mid-point of that year (i.e. 31 December). A simple average across available years is then used to determine the target.	0.073 water in mains incidents per km or mains per year[34]

Table 22 – Indicative targets for ANS

Measure	Data source	Calculation method	Indicative target
Unplanned SAID	Gas supply lost (in minutes) and total number of customers as reported to the ESV quarterly or captured in internal records. The time period covers July 2010 to June 2016.	Aggregate the monthly data into July to June financial year values and divide the gas supply lost (in minutes) by the average number of customers for each year to get an annual unplanned SAIDI. A simple average across available years is then used to determine the target.	0.914 minutes per customer
Reported gas leaks	ANS data provided for the Australian Energy Council's annual gas distribution benchmarking report. This report reports data on a July to June financial year basis. The time period is July 2010 to June 2015.	Aggregate all leaks reported across mains, services, and meters for the relevant financial year. A simple average across available years is then used to determine the target.	12,341 leaks per year

[34] We excluded the 2011 water in mains data point because it appeared to be quite an outlier when compared to performance for surrounding years. This is conservative in that it results in a lower performance target for AGN.

Measure	Data source	Calculation method	Indicative target
Water in mains	ANS water in main data provided for the Australian Energy Council's annual gas distribution benchmarking report. Main length data is sourced from ANS' internal asset management system. The time period is July 2010 to June 2015. Main length data reported as at 31 December for the relevant financial year.	Aggregate water in main incidents for a given July to June financial year divided by total pipeline length as at mid-point of that year (i.e. 31 December). A simple average across available years is then used to determine the target.	0.071 water in mains incidents per km or mains per year[35]

B.2.2 Interaction with CESS calculation

To implement the contingent payment approach, we must specify where and how the standard CESS calculation requires modification. The AER's CESS guideline specifies the CESS reward as: [36]

> *CESS reward = NSP share – net financing benefit*
>
> *We will apply this CESS reward (penalty) as an additional building block adjustment to the [network service provider's] revenue over the upcoming regulatory control period.*

The gas networks would need to modify this as follows:

> *CESS reward = (NSP share – net financing benefit) x CPF*

Where:

1. If NSP share > net financing benefit, and
   a) if the asset performance index (API) > [*minimum threshold*], contingent payment factor (CPF) = 1
   b) if [*maximum threshold*] < API < [*minimum threshold*], CPF = (API – [*maximum threshold*]) / ([*minimum threshold*] – [*maximum threshold*]), and
   c) if API < [*maximum threshold*], CPF = 0, or

[35] Similar to AGN, we excluded the 2011 water in mains data point for ANS because it appeared to be quite an outlier when compared to performance for surrounding years. This is conservative in that it results in a lower performance target for ANS.

[36] AER, *Capital Expenditure Incentive Guideline for Electricity Network Service Providers*, Nov 2013, p.8.

2. If NSP share is ≤ net financing benefit, CPF = 1

The *minimum threshold* and *maximum threshold* for each network is set out Table 3.

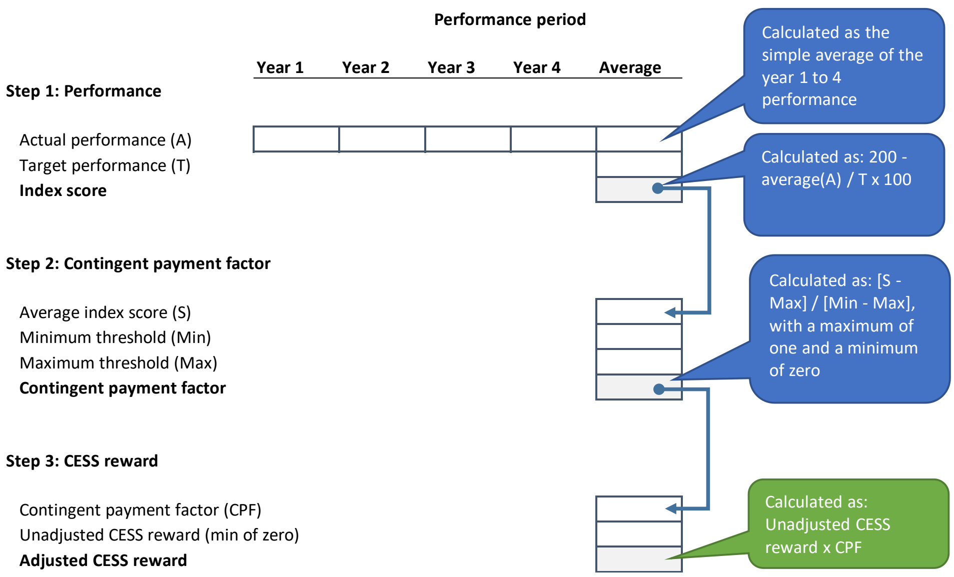
This approach achieves the outcome of:

- Not affecting the CESS penalty when a network overspends its capex allowance
- Deflating the CESS reward in a pro-rate fashion relative to the asset performance index outcome, where the CESS reward has been achieved at the expense of service performance
- Allowing the network to retain the full CESS reward only where it has met its asset performance targets (i.e. maintained performance at historical levels).

B.3 CESS mechanism adjustment

Figure 9 provides an example carryover mechanism that could be used to convert actual performance over a period into a carryover reward or penalty to feed into allowed revenues for a subsequent regulatory period. The example is simplified in that it applies to only one performance measure, but can be easily adapted to apply to the three measures used in our preferred contingent payment design.

Figure 9 – Example adjustment to CESS reward



Appendix C - Terms of reference

Background

Australian Gas Networks (AGN) and AusNet Services (ANS) are each proposing to introduce a capital expenditure sharing scheme (CESS) in the next access arrangement (AA) period.

They have published an issues paper and conducted stakeholder engagement on gas incentive design, the outcomes of which are captured in the FSC report *Victorian Gas Distribution Businesses' consultation on Incentive Mechanisms* dated 23 September 2016 (the Findings Report).

The Australian Energy Regulator (AER) published its Statement of Intent 2016-17 which set out its intention to introduce a CESS for gas distribution businesses. During the incentives consultation process the AER expressed concerns about the possible service performance incentive impacts of introducing a CESS. The Findings Report observed:

> *the AER considered that if a CESS was introduced then at a minimum this needed to be accompanied by a sufficient customer service incentive to counter-balance incentives for inefficient cost reduction. It appeared there was general agreement from stakeholders with this view.*

AGN and ANS have considered two possible options for addressing the AER's service performance counter-balance concerns:

- *Gas Service Target Performance Incentive Scheme (STPIS)* – Developing a gas STPIS based on that which the AER applies to electricity networks
- *Contingent Payment Approach* – Developing a counterbalancing incentive that is self-contained within the CESS design. This option would make earning incentive rewards through the CESS contingent on the network meeting asset condition targets for those measures that the businesses use to monitor service integrity.

Scope

AGN and ANS seek the services of a suitably qualified expert to:

1. Describe the incentive considerations relevant to introducing a CESS and designing balancing service incentives
2. Design a gas STPIS capable of rule compliance
3. Design a contingent payment approach capable of rule compliance
4. Having regard to item 1 and engagement outcomes in the Findings Report, recommend which service counterbalance option is preferable for addressing AER concerns for a CESS applying in the next AA period
5. Note any recommendations for future refinement of service counterbalance incentives.